Surface Circulation in the Northeastern Mediterranean (NEMED)

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LONG-TERM GOALS

To investigate the dynamics of semi-enclosed seas dominated by buoyancy input and wind forcing, and influenced by complex topography. To improve the understanding of coastal marine environmental evolution, with particular emphasis on eddy dynamics.

OBJECTIVES

The main goal on the NEMED project is to measure the surface currents in the Eastern Mediterranean Sea with particular focus to the eastern and northern areas of the Levantine sub-basin and to validate (or not) circulation patterns published in the literature based on in-situ observations (CTD and AXBT), remote sensing data (SST and sea surface topography) and models. It is proposed to use low-cost satellite-tracked drifters to measure currents in the near-surface mixed-layer. The monitoring of the circulation in the Northeastern Mediterranean, with main focus on the currents trapped on the topographic slope and on sub-basin and mesoscale eddies, is planned for a full year in order to investigate any seasonal variability. The surface current observations will be interpreted in concert with the distribution of tracers (SST, chlorophyll, etc.) measured from satellites.

APPROACH

The following tasks will be performed:

- Literature review of the Levantine Sea oceanography.
- Procurement and deployment of SVP (GDP) drifters with Argos data telemetry and positioning. Seasonal deployments of drifters are planned between winter and fall 2009 in three geographical areas: south of Cyprus, east of Israel and south of the Turkey with the help of local oceanographers (see Fig. 1).
- Drifter data management in both near-real time (processing and posting on the web) and delayed-mode (creation of a database updated every three months). Acquisition of satellites images for the Northeastern Mediterranean (SST and ocean color).
- Statistical analyses using the drifter velocity data: mean circulation and eddy variability maps for the different seasons and wind regimes, Lagrangian statistics (integral time and length scales and eddy diffusivities). Qualitative description of the circulation using drifter and

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14. ABSTRACT
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15. SUBJECT TERMS

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satellite data (creation of images and animations with color-coded SST/chlorophyll fields overlaid with drifter tracks).
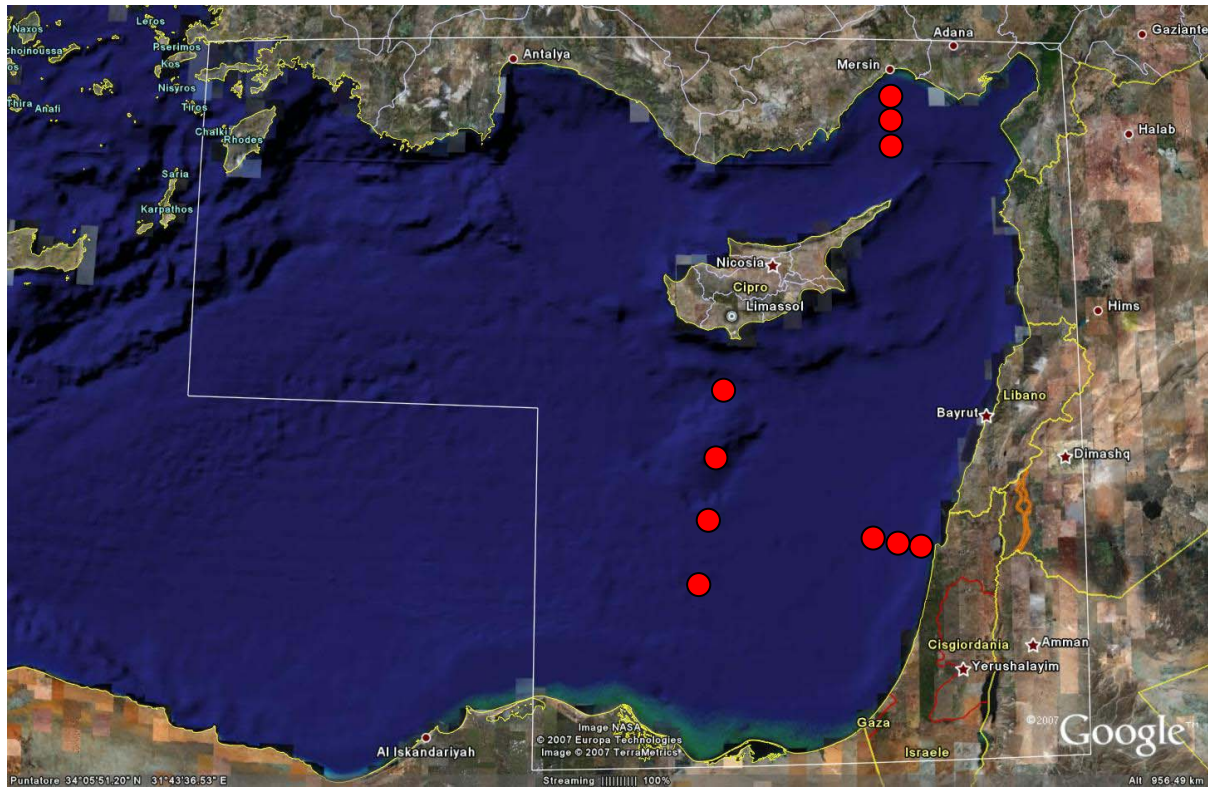

Figure 1. Eastern and northern areas of the Levantine sub-basin with planned drifter deployment sites south of Limassol (Cyprus), west of Haifa (Israel) and south of Mersin (Turkey).

WORK COMPLETED

Except for the literature review, none of the tasks mentioned above has effectively started as of September 2008. Procurement and planning for the drifter deployments will start in fall 2008.

RESULTS

N/A

IMPACT/APPLICATION

The scientific impact of this project is to increase our understanding of the Northeastern Mediterranean Sea dynamics and of its major forcing mechanisms. Future application could be the validation of diagnostic numerical models and the assimilation of the drifter data into prognostic numerical models in the framework of operational oceanography projects (e.g., as part of the Mediterranean Operational Oceanography Network – MOON).

RELATED PROJECTS

In addition to national programs conducted by collaborators in Cyprus, Israel and Turkey, the NEMED project is strongly related to MOON (http://www.moon-oceanforecasting.eu/).

NEMED is related to the following MOON observational activities:

- The Mediterranean Volunteer Observing Ship program(VOS) coordinated by Dr. G. Manzella

  http://moon.santateresa.enea.it/

- The Mediterranean Argo program (MedArgo) coordinated by the P.I.

  http://poseidon.ogs.trieste.it/sire/medargo/

MOON nowcasting and forecasting systems relevant to NEMED are:

- The ALERMO Forecasting System

  http://pelagos.oc.phys.uoa.gr/mfstep/bulletin/

- The Cyprus Coastal Ocean Forecasting and Observing System (CYCOFOS)

  http://www.oceanography.ucy.ac.cy/cycofos//

- The South Eastern Levantine Israeli Prediction System (SELIPS)

  http://isramar.ocean.org.il/ShelfModel/

  The Cilician Basin and Northern Levantine Forecasting Systems

  http://linux-server.ims.metu.edu.tr/klevant/

  http://linux-server.ims.metu.edu.tr/kilikya/